CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

No. 16-77

RESOLUTION

AUTHORIZING THE FILING OF A TRANSPORTATION INVESTMENT GENERATING ECONOMIC RECOVERY ("TIGER") GRANT APPLICATION WITH THE U.S. DEPARTMENT OF TRANSPORTATION ("USDOT") FOR THE HONOLULU URBAN BUS CIRCULATOR SYSTEM PROJECT

WHEREAS, Chapter 1, Article 8, Revised Ordinances of Honolulu 1990, requires that any intergovernmental agreement or any amendments thereto that place an obligation on the City or any department or agency thereof requires prior City Council consent and approval; and

WHEREAS, the USDOT has been delegated authority to award TIGER federal financial assistance grants to fund transportation and public transit projects that achieve national transportation objectives and have significant impacts on metropolitan areas; and

WHEREAS, the first phase of the TIGER grant application process involves submission to the USDOT of a visionary narrative describing the proposed transportation and public transit project; and

WHEREAS, if a TIGER grant application is selected by the USDOT, the applicant would then begin discussions with the USDOT to negotiate the terms of a cooperative agreement for a TIGER grant; and

WHEREAS, the TIGER grant cooperative agreement typically imposes certain obligations on the applicant, and may require the applicant to provide the local share of project costs; and

WHEREAS, the City desires to apply for a $25.5 million TIGER grant from the USDOT to fund a premium high-frequency high-capacity electric bus circulator system in Honolulu's urban core; now, therefore,

BE IT RESOLVED by the Council of the City and County of Honolulu that the City's application for a USDOT TIGER grant in substantially the form attached hereto as Exhibit A is approved; and

BE IT FURTHER RESOLVED that the Director of the Department of Transportation Services ("DTS") is authorized to apply for TIGER grant funds for the Honolulu Urban Bus Circulator System project pursuant to the approved application; and

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

No. 16-77

RESOLUTION

BE IT FURTHER RESOLVED that any subsequent TIGER grant cooperative agreement with the USDOT requires the prior consent and approval of the Council pursuant to ROH Chapter 1, Article 8; and

BE IT FINALLY RESOLVED that copies of this Resolution be transmitted to Mr. Michael D. Formby, Director of the DTS.

INTRODUCED BY:

(br)

DATE OF INTRODUCTION:

MAR 2 2 2016
Honolulu, Hawaii

Councilmembers

OMB Number: 4040-0004
Expiration Date: 8/31/2016

Application for Federal Assistance SF-424

* 1. Type of Submission:	* 2. Type of Application:	* If Revision, select appropriate letter(s):
☐ Preapplication	☒ New	
☒ Application	☐ Continuation	* Other (Specify):
☐ Changed/Corrected Application	☐ Revision	

* 3. Date Received:	4. Applicant Identifier:
Completed by Grants.gov upon submission.	

5a. Federal Entity Identifier:	5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:	7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: City and County of Honolulu Department of Transportation Services

* b. Employer/Taxpayer Identification Number (EIN/TIN):	* c. Organizational DUNS:
99-6001257	614644565

d. Address:

* Street1:	650 South King Street 3rd Floor
Street2:	
* City:	Honolulu
County/Parish:	
* State:	Hawaii
Province:	
* Country:	USA: UNITED STATES
* Zip / Postal Code:	96813

e. Organizational Unit:

Department Name:	Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:		* First Name:	Mark
Middle Name:			
* Last Name:	Garrity		
Suffix:			

Title:

Organizational Affiliation:

* Telephone Number:	Fax Number:
8087688304	

* Email: mgarrity@honolulu.gov

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

11. Catalog of Federal Domestic Assistance Number:

CFDA Title:

*** 12. Funding Opportunity Number:**

* Title:

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Honolulu Urban Bus (HUB) Circulator System

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: HI-C01 * b. Program/Project: HI-D01

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 07/01/2017 * b. End Date: 12/31/2020

18. Estimated Funding ($):

* a. Federal	25,500,000
* b. Applicant	0.00
* c. State	0.00
* d. Local	6,400,000
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	31,900,000

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

- [ ] a. This application was made available to the State under the Executive Order 12372 Process for review on .
- [ ] b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- [X] c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

- [ ] Yes
- [X] No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

- [X] ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: * First Name: Michael

Middle Name:

* Last Name: Formby

Suffix:

* Title: Director of Transportation Services

* Telephone Number: 8087688303 Fax Number:

* Email: mformby@honolulu.gov

* Signature of Authorized Representative: Completed by Grants.gov upon submission. * Date Signed: Completed by Grants.gov upon submission.

ATTACHMENTS FORM

Instructions: On this form, you will attach the various files that make up your grant application. Please consult with the appropriate Agency Guidelines for more information about each needed file. Please remember that any files you attach must be in the document format and named as specified in the Guidelines.

Important: Please attach your files in the proper sequence. See the appropriate Agency Guidelines for details.

1) Please attach Attachment 1		Add Attachment	Delete Attachment	View Attachment
2) Please attach Attachment 2		Add Attachment	Delete Attachment	View Attachment
3) Please attach Attachment 3		Add Attachment	Delete Attachment	View Attachment
4) Please attach Attachment 4		Add Attachment	Delete Attachment	View Attachment
5) Please attach Attachment 5		Add Attachment	Delete Attachment	View Attachment
6) Please attach Attachment 6		Add Attachment	Delete Attachment	View Attachment
7) Please attach Attachment 7		Add Attachment	Delete Attachment	View Attachment
8) Please attach Attachment 8		Add Attachment	Delete Attachment	View Attachment
9) Please attach Attachment 9		Add Attachment	Delete Attachment	View Attachment
10) Please attach Attachment 10		Add Attachment	Delete Attachment	View Attachment
11) Please attach Attachment 11		Add Attachment	Delete Attachment	View Attachment
12) Please attach Attachment 12		Add Attachment	Delete Attachment	View Attachment
13) Please attach Attachment 13		Add Attachment	Delete Attachment	View Attachment
14) Please attach Attachment 14		Add Attachment	Delete Attachment	View Attachment
15) Please attach Attachment 15		Add Attachment	Delete Attachment	View Attachment

HONOLULU URBAN BUS (HUB) CIRCULATOR SYSTEM

Project Type
Public Transit Capital Project

TIGER FUNDS REQUESTED
$25.5 million (80%)

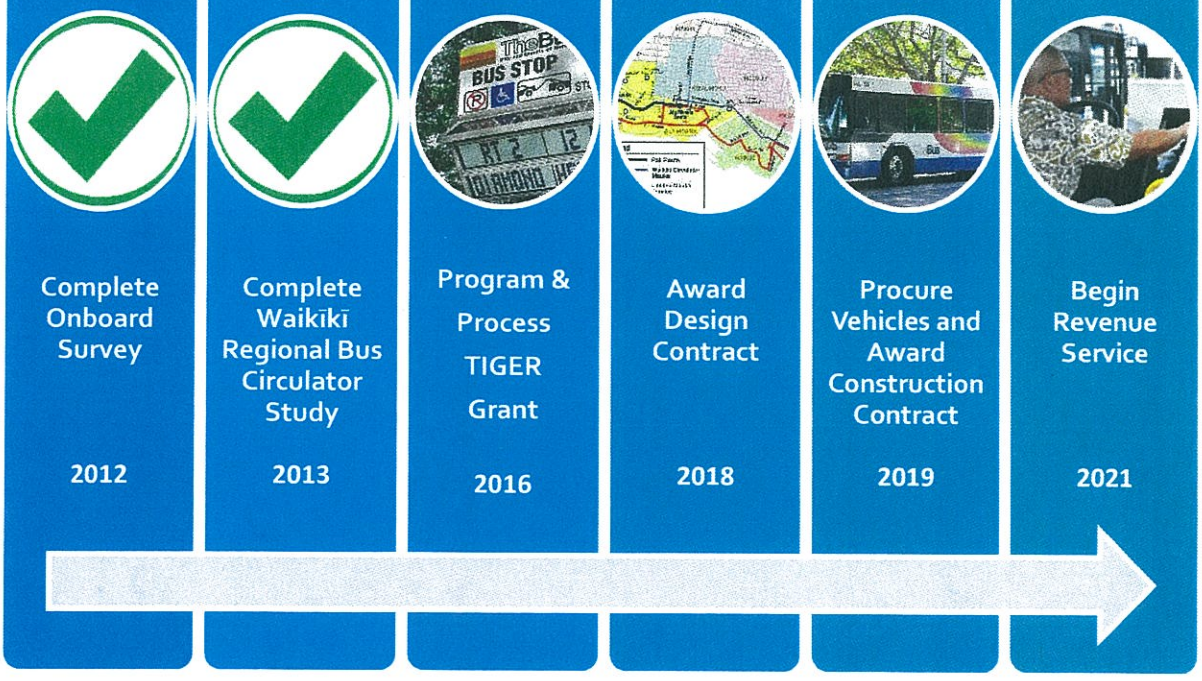
Primary Contact
Mike Formby
Director, Department of Transportation Services

Location
Honolulu, Hawai'i

Committed Match
$6.39 (20%)

Total Project Cost
$31.9 million

650 South King Street, Honolulu Hawai'i
808.768.8355
mformby@honolulu.gov



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1 PROJECT OVERVIEW

The Honolulu Urban Bus (HUB) Circulator System is a cost-effective solution that significantly advances mobility in the most congested areas of Honolulu, Hawai'i. The City and County of Honolulu (City) requests $25.54 million from the U.S. Department of Transportation (DOT) Transportation Investment Generating Economic Recovery (TIGER) Capital Grant to fund a premium high-frequency, high-capacity all-electric bus circulator system in Honolulu's urban core.

The HUB began as a multi-year community-driven planning effort dating back to 2008 with the development of the Locally Preferred Alternative (LPA) that extends east to Waikīkī and UH Mānoa in the Honolulu High Capacity Corridor Project (renamed the HRTP) Draft Environmental Impact Statement (DEIS). The HUB builds upon operational and route recommendations identified in the Federal Highway Administration (FHWA) funded 2013 Waikīkī Regional Circulator Study (WRCS) as well as the results of the ridership data from the Federal Transit Administration (FTA) funded 2012 On-Board Transit Survey.

These plans identify the need for improved access for all users especially economically disadvantaged populations that work in the areas surrounding the HUB. There is a huge population/employment base surrounding the proposed HUB system. Forty-one percent of all current bus commuters have destinations within a half-mile of the proposed HUB system.[1] Improving access to destinations along the HUB corridor can therefore have a huge positive impact on a large base of existing bus riders, as well as, help to attract new riders. In addition to the HUB's large market potential, the HUB will serve economically disadvantaged populations and minorities. Seventy percent of current commuters with destinations served by the HUB are non-white minorities. Over 15 percent of these commuters come from neighborhoods where 15 to over 60 percent of residents are below the poverty line.

The market potential for transit service in the areas surrounding the HUB is expected to grow. TheBus, Honolulu's public bus system, operated by O'ahu Transit Services (OTS), demonstrates the highest per-capita ridership in the country among cities without a major rail system, and the fifth highest ridership overall. Linked trips are expected to increase by 60 percent over the next 15 years to 88 million. Moreover, in 2021, when the Honolulu Rail Transit Project[2] (HRTP) is fully operational, creating a last-mile connection between the easternmost stations to low-income neighborhoods and educational and employment centers will be paramount. More than 30,000 daily riders are expected to use the Ala Moana Station. This last-mile connection will need to be seamless: continuous, convenient, and connective.

Over the last 20 years, average speeds have dropped from 14.6 to 12.9 miles per hour. Increased traffic congestion, accidents, and population are partly to blame for reduced average speeds and reliability. Further analysis indicates that bus travel delays result from inefficiencies related to passenger loading and transit signal delays. Major bus routes (Route 2, 8, and 13) servicing Waikīkī operate with average speeds of just six to seven miles per hour. If current vehicle speeds remain the same or decline, passengers could spend more time completing the last two miles of their commute than the first 20 miles on rail.

The HUB is designed to accommodate the high passenger flows created by the HRTP, while alleviating the barriers that slow down traditional bus service. It will provide frequent and efficient connections to major destina-

[1] Source: On-Board Transit Survey (HART, 2012)

[2] The Honolulu Authority for Rapid Transportation (HART) is the agency responsible for overseeing the design, construction, and operations of the HRTP.

tions such as Waikīkī, the largest employment center outside of the central business district, and the University of Hawai'i at Mānoa (UH Mānoa), Hawai'i's largest public university and major trip generator.

The HUB will improve mobility through urban Honolulu's most congested neighborhoods through three overarching strategies:

1. **Circulator Buses:** Specially-branded all-electric buses with all-door passenger boarding and alighting, luggage storage, and digital passenger information system along three routes
2. **Dynamic Scheduling:** Cloud-based automatic vehicle location and monitoring system (AVL/AVM) and continuous automatic location-based real-time controls, which will ensure even spacing of frequent HUB service and eliminate bus bunching.
3. **Enhanced Infrastructure:** Advanced transit-priority traffic signals including transit-priority signals such as queue jumpers combined with transit-exclusive right-of-way at key locations. Bus stops will also be enhanced with improved signage and wayfinding information, and real-time information system.

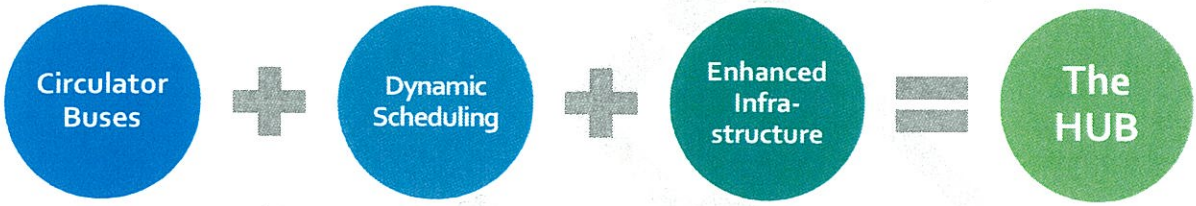


Figure 1 Key Components of the HUB

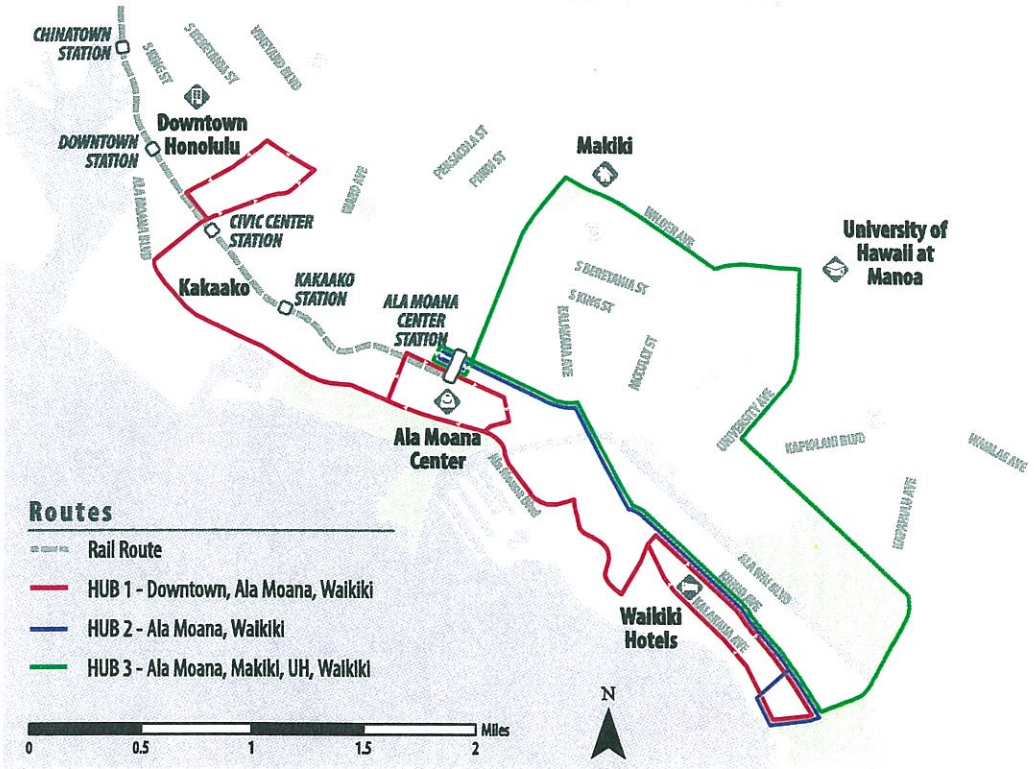


Figure 2 The HUB Circulator System

2 PROJECT BACKGROUND

2.1 Project Location

The HUB will provide an essential connection between the HRTP, Waikiki, and UH Mānoa, but will also serve many communities in nearby areas. Figure 3 shows the 11 distinct neighborhood areas that are linked together via the HUB. Each neighborhood has its own unique character and transportation needs. Collectively, these neighborhood areas have a population of 150,474 people, representing more than 15% of Oahu's total population of 953,207. The proposed circulator routes will provide access to the two largest and densest residential neighborhoods on the island, Waikiki and Makiki.

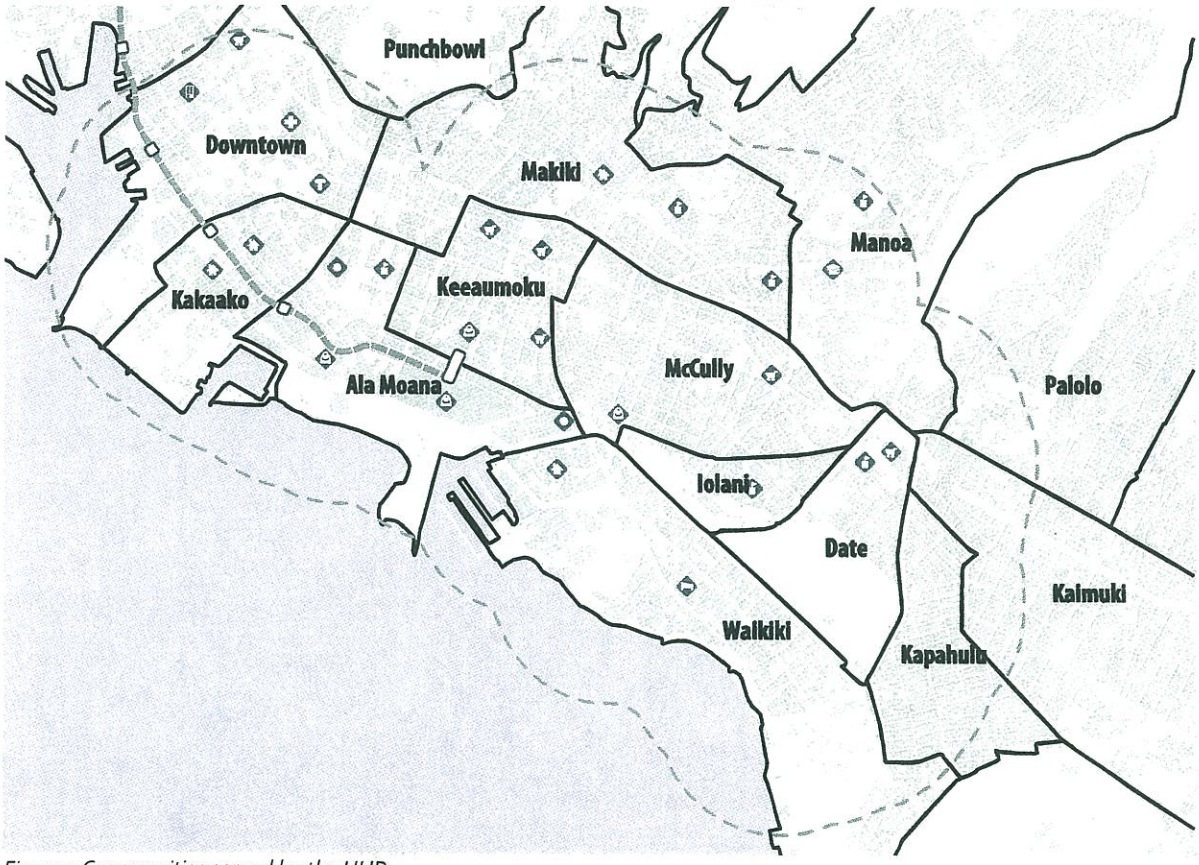


Figure 3 Communities served by the HUB

Of the 358,295 employment destinations on Oahu, almost half or 152,293 are within a half-mile of the proposed HUB routes. The routes contain areas such as Date, McCully, Makiki and Keeaumoku with a high percent of the poverty population. Similarly, there were many minority populations along the proposed HUB, the populations are found in the following areas: Kaimuki, Makiki, Mānoa, and McCully. Good transit connections will provide ladders of opportunity for these areas by reaching the high concentration of employment opportunities within the routes.

The HUB fully leverages the benefits of the HRTP and creates a last-mile connection between the easternmost stations to low-income neighborhoods and educational and employment centers. This improves access to jobs,

health care, and education for over 60 percent of Honolulu residents while providing continuous mobility to destinations such as Waikīkī, the largest employment center outside of the central business district, and the University of Hawai'i at Mānoa (UH Mānoa), Hawai'i's primary public university. This project is supportive of economic competitiveness, quality of life, and environmental sustainability.

Waikiki

Waikiki is Hawaii's primary tourist hub and an employment center that provides over 25,000 jobs. The neighborhood extends from the Ala Wai Canal on the west and north, to Diamond Head on the east. Residents, workers and visitors make Waikiki one of the highest densities in the country rivaling the densest parts of Manhattan. Waikiki is the anchor for the State's visitor industry, which is a major driving force in Hawaii's economy. There are approximately 35,000 hotel-type units on Oahu with an overwhelming majority in Waikiki.[3]

WAIKIKI HAS ONE OF THE HIGHEST DENSITIES IN THE COUNTRY RIVALING THE DENSEST PARTS OF MANHATTAN.

Kakaako District

Kakaako is between the central business district and Waikiki and under the jurisdiction of the Hawaii Community Development Authority (HCDA). Historically light industrial area the area is rapidly transforming itself into a major residential and retail center. Its population is expected to increase from about 12,000 residents today to about 30,000 by 2030. Between 1990 and 2010, the area grew by almost 500 percent. Two HRTP rail stations will serve Kakaako, but there is limited bus service. The HUB will provide service between rail stations and will connect Downtown and the Capital District to the west and Ala Moana and Waikiki to the east.

Figure 4 Kakaako Community Development District

Ala Moana Center

Ala Moana Center (AMC), located between Waikiki and Kaka'ako, is Honolulu's largest shopping center. The shopping center is a major destination for both visitors to the Island and local residents. AMC transit center is the largest transit center in TheBus system with over 32,000 transit trip ends (boarding plus alighting passengers). The transit center is served by more than 1,500 individual bus vehicle trips and 22 bus routes originating from all parts of Oahu. AMC will also the east terminus for the HRTP. Seven percent of all boarding passengers begin their journey at Ala Moana Center Station.

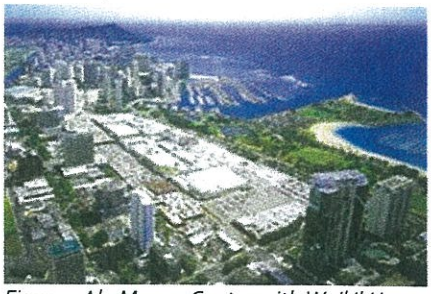


Figure 5 Ala Moana Center with Waikiki in Background

The rail ridership projection predicts that 16,240 passengers per day will exit and enter the rail system by 2020 (32,480 trip ends) at Ala Moana Center Station. This is projected to rise to 22,610 passengers by 2030 (45,220 trip ends). Many of the passengers exiting the rail system at AMC will travel to Waikiki or UH Mānoa.

[3] 2013 Visitor Plant Inventory, Hawai'i Tourism Authority, 2014, See http://dbedt.Hawai'i.gov/visitor/visitor-plant/

Kapahulu/Moiliili District

Kapahulu and Moiliili are located between Waikiki and the University of Hawai'i. Kapahulu is undergoing a renaissance, attracting new businesses, restaurants, antique stores, and surf shops. Mō'ili"ili is a small and local community composed of numerous small businesses such as florists, imported goods, ethnic foods, and apparel. Its core is at the intersection of University Avenue and King Street.

University of Hawai'i at Mānoa (UH Mānoa)

UH Mānoa, the flagship campus of the University of Hawai'i system, is located in Mānoa Valley approximately three miles east and inland from Downtown Honolulu and one mile from Ala Moana and Waikīkī. UH Mānoa is a huge trip generator. Total enrollment exceeds 20,000 students, with about a 75 percent undergraduate student body. The campus accommodates night school, extension and continuing education programs, which brings total enrollment up to almost 50,000. Over 5000 faculty and staff work at UH Mānoa.

The University is a major transit destination. The campus has a U-Pass program in which transit fees are a mandatory part of student fees and allows students to ride TheBus services for free.

Mauka Makiki

Mauka Makiki is an area of Honolulu disected by the Lunalilo Freeway. The mauka area is characterized by a large number of apartments and condominims. The density within a half mile of the circulator corridor is more than 30,000 people per square mile and provide more affordable housing options.

Public transportation service is poor in Makiki. Most Makiki residents work in Waikīkī or Downtown. Both areas are poorly served by existing bus routes, which follow a circuitous routing. Many UH Mānoa students live in the Makiki district.

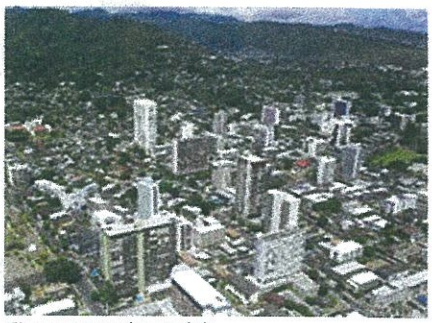


Figure 6 Mauka Makiki

Ke'eaumoku District

Ke'eaumoku includes the area makai of the Lunalilo Freeway. The area is centered on Ke'eaumoku Street between Kapi'olani Boulevard and South King Street and has a density of about 24,000 people per square mile. In recent years, there has been considerable development – probably in anticipation of rail. There is a significant Korean population and is sometimes referred to as "Koreatown".

Figure 7 Ke'eaumoku Street Construction

Summary of Neighborhood Characteristics

The neighborhoods within the HUB ½ catchment area are some of Oahu's and some of the State's most dense residential and commercial areas. In fact, the areas surrounding the HUB encompass 43% of all jobs on Oahu. These neighborhoods also contain a large number of minority, disabled, and low-income individuals.

Table 1 Summary of Demographic and Employment Characteristics of Neighborhoods Surrounding the HUB

Census Tract Cluster Areas	Employ-ment Desti-nations[4]	% Total Jobs[4]	Universe: Disability and Minority Pop.[5]	Disabled Pop.[5]	% Disabled Pop.[5]	Minority Pop.[5]	% Minority Pop.[5]	Universe: Poverty Pop.[5]	Poverty Pop.[5]	% Poverty Pop.[5]
Ala Moana	23,836	4.8%	5,468	353	6.5%	3,857	70.5%	5,366	505	9.4%
Date	728	0.1%	3,942	197	5.0%	3,275	83.1%	3,773	550	14.6%
Downtown	50,936	10.4%	9,627	1,230	12.8%	7,438	77.3%	9,792	1,039	10.6%
Iolani	715	0.1%	7,128	594	8.3%	5,621	78.9%	7,038	568	8.1%
Kaimuki	5,373	1.1%	13,733	1,428	10.4%	12,093	88.1%	13,692	918	6.7%
Kakaako	9,370	1.9%	3,688	396	10.7%	2,876	78.0%	3,726	166	4.5%
Keeaumoku	14,394	2.9%	12,663	1,798	14.2%	11,003	86.9%	12,980	1,949	15.0%
Makiki	5,549	1.1%	28,527	2,392	8.4%	22,585	79.2%	28,691	4,217	14.7%
Manoa	3,064	0.6%	18,997	1,605	8.4%	14,496	76.3%	16,037	1,103	6.9%
McCully	8,146	1.7%	19,008	1,933	10.2%	16,493	86.8%	18,704	3,326	17.8%
Waikiki	30,182	6.1%	23,651	2,627	11.1%	12,489	52.8%	23,194	3,566	15.4%
Total Area	152,293	31.0%	146,432	14,553	9.9%	112,226	76.6%	142,993	17,907	12.5%
Oahu	**358,295**	**72.8%**	**915,669**	**95,039**	**10.4%**	**738,626**	**80.7%**	**934,319**	**91,904**	**9.8%**
State	**491,896**	**100.0%**	**1,318,486**	**142,731**	**10.8%**	**1,003,965**	**76.1%**	**1,334,759**	**148,600**	**11.1%**

[4] Data Source: 2011 Census Blocks - LEHD Origin/ Destination
[5] Data Source: 2013 Census Tracts – American Community Survey

2.2 Existing Transit Service

The existing bus system provides service within most areas targeted by the HUB; however, the existing system is inadequate to meet the increased passenger activity generated by the HRTP (see Section o Ridership Projections in 2021). Some areas such as Ala Moana, Waikīkī and UH Mānoa currently have high ridership and high levels of service. However, Makiki, a densely populated neighborhood, receives significantly less service.

Additional direct routes and higher frequency bus arrivals can attract ridership from Makiki. Due to roadway constraints and the H-1 Freeway, mauka-makai routes are often circuitous and do not provide fast, convenient, or direct routing to Waikīkī or Downtown. Table 2 compares the amount of service in central Honolulu and smaller sub districts to the full system.

Table 2 Daily Bus System Penetration to Regions of Oahu

System Segment	Vehicle Pull Outs	No. of Routes	Total Trips	Revenue Hours	Total Vehicle Hours[6]	Total Route Ridership[1]
Downtown Honolulu	486	66	2,647	2,925	3,331	198,710
Ala Moana	165	22	1,444	1,512	1,650	121,729
Waikīkī	98	16	773	709	790	77,342
UH Mānoa	86	10	722	790	846	57,812
Makiki	26	5	333	344	358	15,594
Full System	**586**	**102**	**3,882**	**3,843**	**4,333**	**215,006**

[1] Total ridership on the full route- not necessarily in the area

Although current bus system serves Downtown Honolulu, Waikīkī, and UH Mānoa, the average speed and reliability have declined. The average speed of the three major routes (Routes 2, 8 and 13) that operate within Waikiki have average speeds between 6 mph and 7 mph during most of the day from about 8:00 a.m. to 8:00 p.m. due to limited entry and exit roadways. This results in poor and erratic vehicle schedule adherence. Seasonal tourism, frequent parades and other special events contribute to unreliable service and considerable bus bunching. Street supervisors and radio controllers attempt to regulate service, but the result is less than adequate.

A proliferation of automobiles, truck traffic, public and private buses, and shuttle operations have exacerbated challenges and worsened street performance. As evident in Table 2 16 bus routes currently serve Waikīkī, providing almost 800 bus trips per day. Many passengers transfer from other bus routes to access Waikīkī.

Figure 8 shows large transfer movements at the King-Beretania junction, Punchbowl Street, and Ala Moana Center. Passengers who now transfer at these points will ride to the end of the rail line and transfer to the HUB, increasing ridership at Ala Moana.

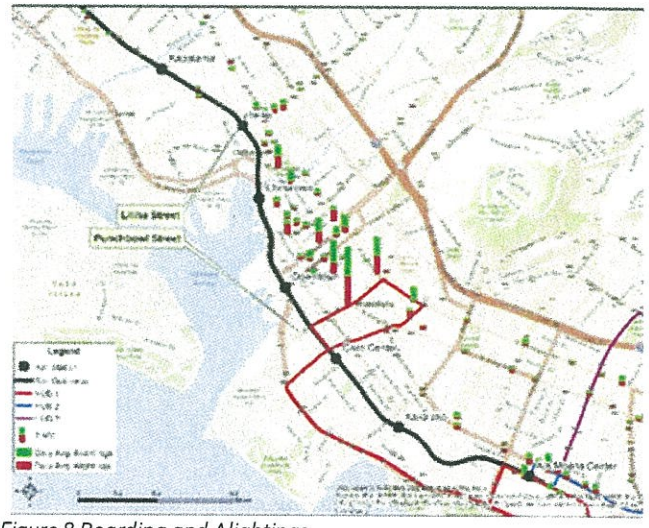


Figure 8 Boarding and Alightings

[6] Total Vehicle Hours = Revenue Hours + Deadhead

Figure 9 Current Waikīkī Bus Service

Route Number	Areas Served	Weekday Unlinked Passenger Trips	Daily Vehicle Trips	Daily Vehicle Hours	Peak Vehicles	Approx. Headway (min)	Buses/ Hour
2	Kalihi-Downtown-King St-Waikīkī	21,963	140	182.1	25	15	4.0
4	Nuuanu-Downtown-Makiki-UH-Pawaa-Waikīkī	6,232	95	101.6	12	20	3.0
8	Ala Moana Center to Waikīkī	3,978	69	18.0	9	10	6.0
13	Liliha-Downtown-Kapi'olani-Ala Moana Center-Waikīkī	14,009	52	24.3	15	15	4.0
19	Airport-Nimitz-Ala Moana Blvd-Waikīkī	4,778	12	22.2	12	40	1.5
20	Arizona Memorial-Nimitz-Downtown-Ala Moana-Waikīkī	3,401	46	60.5	1	40	1.5
22	Kaiwi Scenic Coast-Hanauma Bay Nature Reserve.-East Oahu-Waikīkī	825	31	19.9	4	60	1.0
23	Aina Haina-Kahala-Waikīkī-UH-Makiki-Ala Moana	2,391	58	23.0	3	40	1.5
24	Sea Life Park-East Oahu- Waikīkī-Ala Moana Center	547	45	45.3	3	30	2.0
42	Ewa Beach-Waipahu-Pearl City-Arizona-Kalihi-Downtown-Ala Moana-Waikīkī	8,972	36	41.3	14	30	2.0
2L	Kalihi-Downtown-Waikīkī Peak Service Only	1,914	113	127.4	0	0	0.0
E	Ewa Beach-Waipahu-Downtown-Ala Moana Center – Waikīkī	4,909	43	81.8	10	35	1.7
W1	Ewa Beach-Waipahu-Waikīkī Peak Hour Express	583	4	5.2	3	0	0.0
W2	Waipahu to Waikīkī Peak Hour Express	256	11	22.2	4	0	0.0
W3	Kalihi to Waikīkī Peak hour Express	171	6	12.0	1	0	0.0
Total		**74,929**	**773**	**790.2**	**116**		**28.2**

3 PROJECT NEED

3.1 Growing Demand for Transit

When rail transit reaches its east terminus at Ala Moana Station in 2019, it will fundamentally change commuter patterns. Nearly 23,000 passengers are projected to disembark from rail every weekday and an equal number will board. At peak times, a four-car train will arrive at Ala Moana Station every six minutes. Projections suggest that there will be almost three times as many passengers at Ala Moana than the next largest station, located in the Central Business District. The surrounding areas are some of the most populated and employment dense on O'ahu. Passengers need high frequency and high capacity bus service to meet their last mile connection.

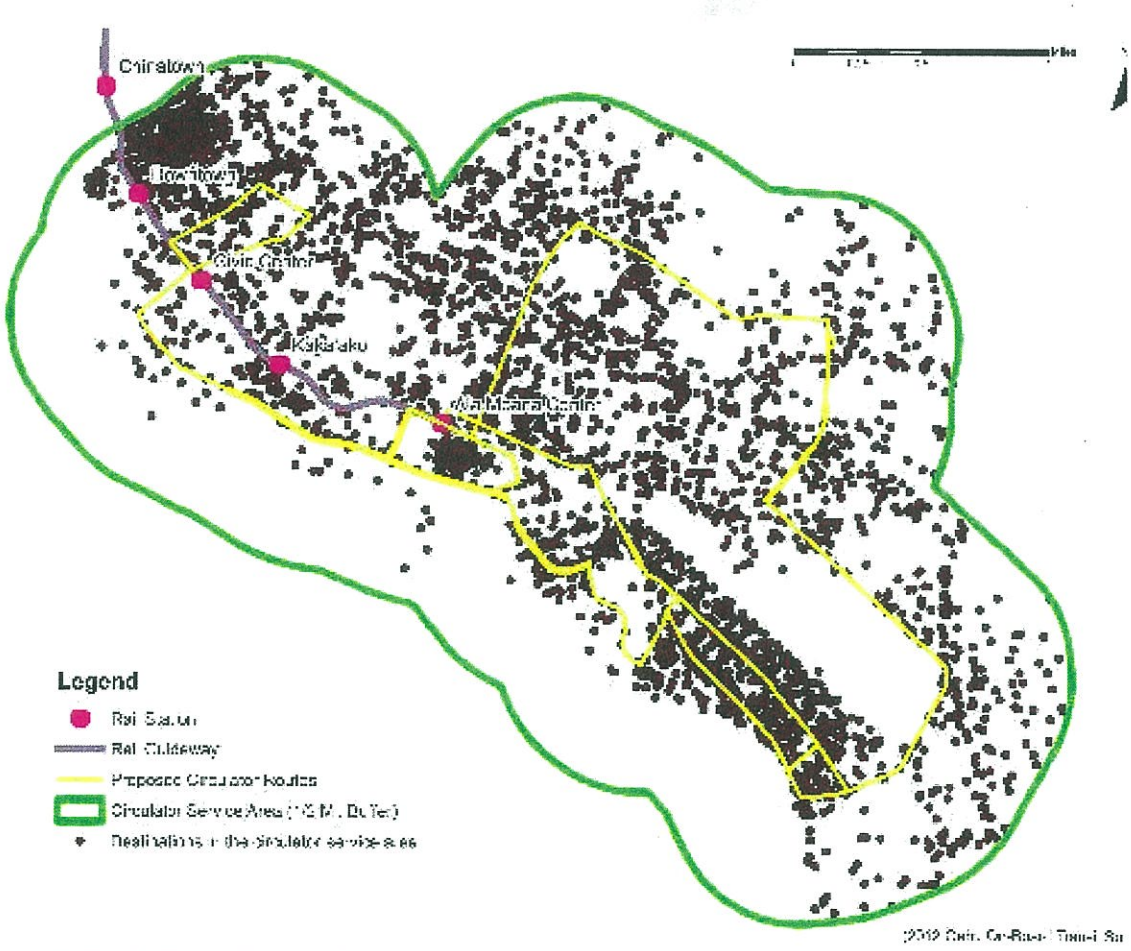


Figure 10 Existing Destinations in HUB Area

Ridership Projections in 2021

Honolulu has high per-capita transit ridership, even though it currently lacks a rail system. In 2013, Honolulu's per-capita ridership was fifth highest in the country, and the highest city without a major rail system. In central Honolulu, overall transit ridership is projected to increase significantly with the introduction of rail. Linked trips are projected to increase from about 55 million today, to about 88 million trips by 2030—a 60% increase over the next fifteen years.

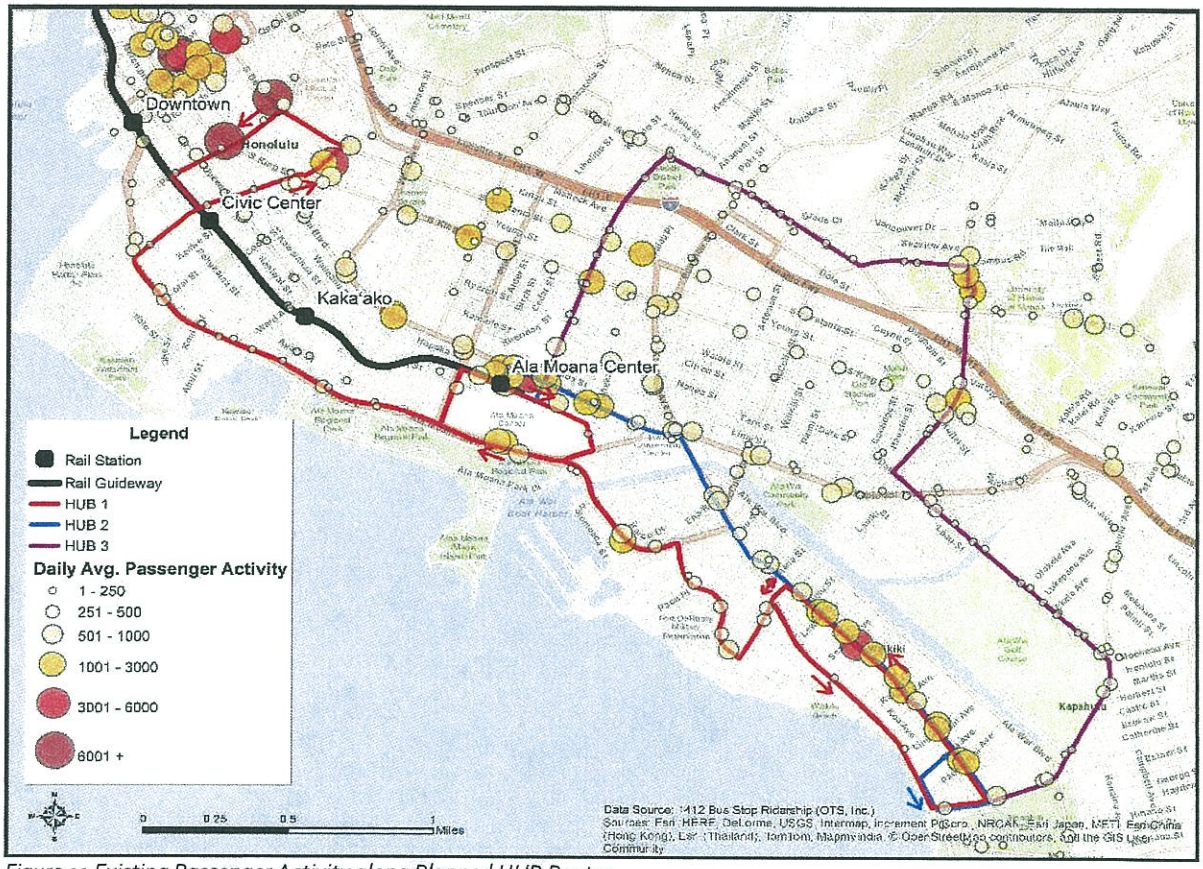


Figure 11 Existing Passenger Activity along Planned HUB Routes

HUB Ridership Estimates

Ridership estimates were derived using HART's regional travel demand forecasting model. These estimates were validated using detailed stop-by-stop boardings and alighting data, and by comparing the results to HART's 2012 Bus O-D survey. Both independent methods resulted in similar forecasts. HART's ridership model projects 30,343 passengers per day for the HUB circulator systems in 2021.

Table 3 Estimated HUB Ridership in 2021

Routes	Headways (minutes)			Estimated Daily Ridership in 2021
	AM Peak	Mid-Day	PM Peak	
HUB 1 Makai Waikiki	5	10	5	14,878
HUB 2 Mauka Waikiki	3.75	9	3.75	12,220
HUB 3 UH-Makiki	15	18	15	3,245
Total HUB				**30,343**

3.2 Access to employment

Approximately 41 percent of the surveyed commuters had a destination within a half mile of the HUB.[7] Many of these commuters will need to make connections to rail service as well as to transfer points for regional bus service. Figure 12 shows commuters who traveled to a destination within a half mile of HUB. Not surprisingly, this ½ mile area surrounding the HUB, also contains nearly half of all jobs on Oahu.

Over 91% of the Waikiki workforce must commute to work. High parking costs and high employment densities make commuting to Waikiki via bus appealing. However, under status quo conditions, commuters could spend more time on the last 2 miles from Ala Moana to Waikīkī than the first 20 miles by rail.

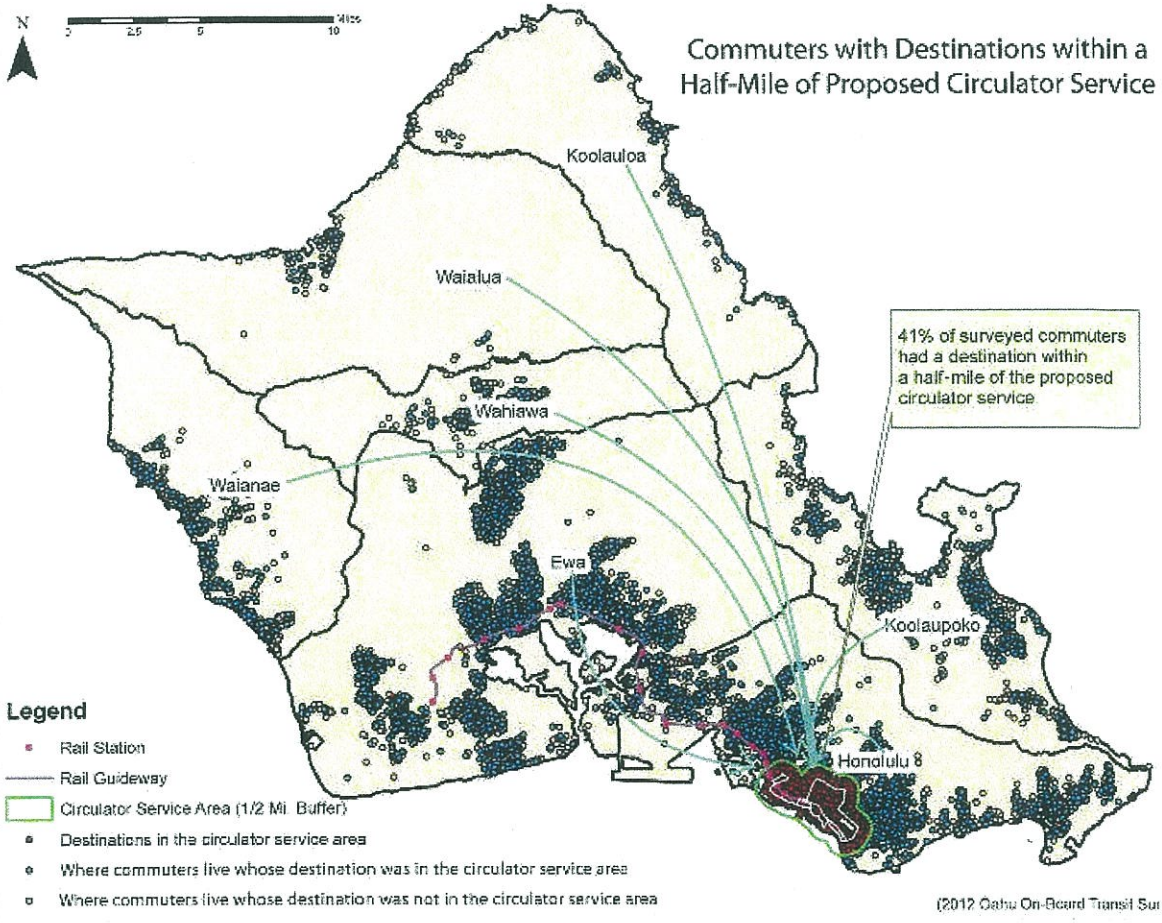


Figure 12 Commuters with Destinations within a Half-Mile of the HUB

[7] Appendix V, Table 1.

3.3 Declining Speed of Transit Service

In 2014, Honolulu traffic congestion was ranked as the third worst in the country.[8] Congestion not only increases the average time it takes to travel, it increases the volatility of travel times to the point where fixed schedules become meaningless. The actual running time of the Route 8, which operates from Ala Moana to Waikīkī, consistently exceeds scheduled time. Westbound trips are in excess of 50 minutes with some trips averaging more than 70 minutes. Eastbound trips are around 40 minutes on average with some morning trips in excess of 50 minutes. Hence, some commuters would likely spend more time on the last 2 miles than the time to travel 20 miles by rail.

Since 1984, the average system speed for TheBus has dropped from 14.6 to 12.9 mph. As a result, it requires 500 more hours of service each day to provide the same amount of service mileage as compared to the conditions that existed in 1984. If all those lost hours were invested in today's system, service could be increased by 13 percent. The cost of congestion over the period represents about $16.5 million in additional annual operating costs.

The impact of lower operating speeds in central Honolulu is even greater than the system-wide average. For example, since 1992, the scheduled time for a round trip on the Route 8, which serves Waikīkī, has increased by 32 percent from 44 minutes to 65 minutes. Even with these increases, the Route 8 consistently runs late and the actual running time is now often more than 70 minutes. Other routes in central Honolulu show a similar pattern.

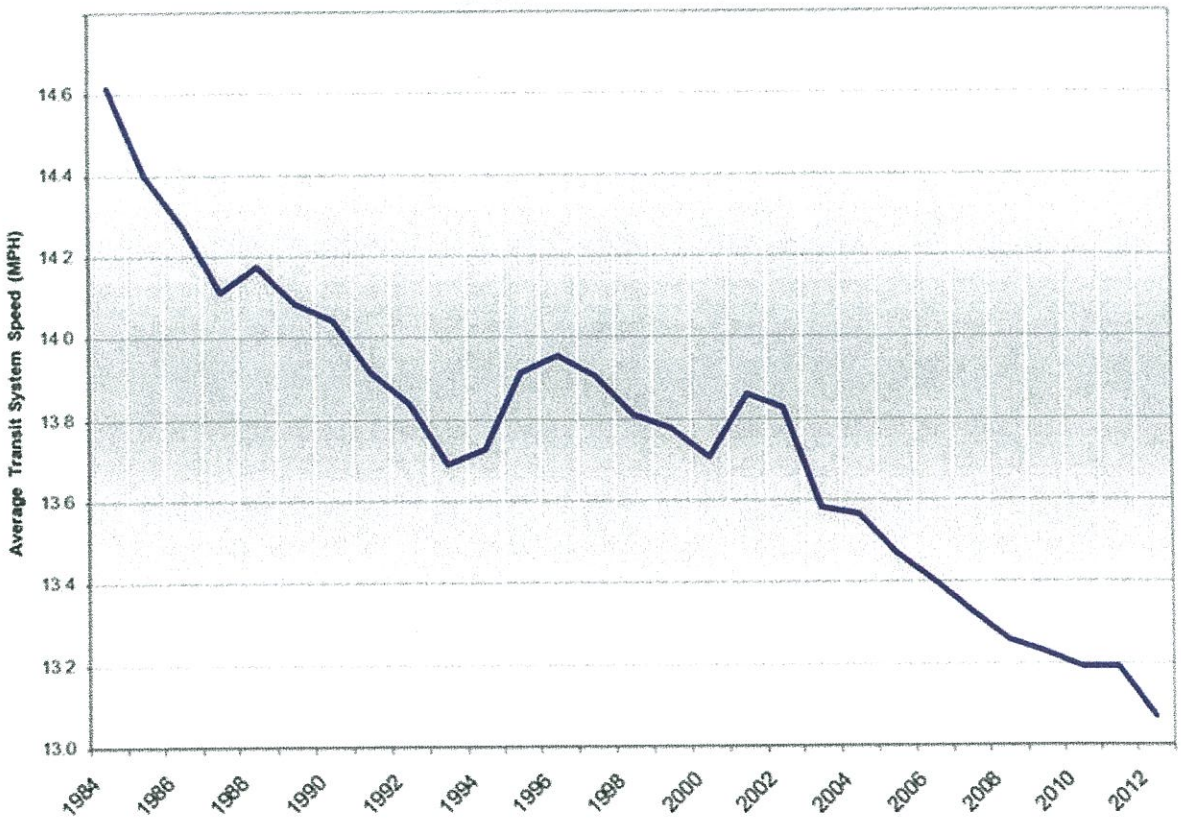


Figure 13 Average System Speed 1984-2012

[8] TomTom International BV, TOMTOM Traffic Index, Measuring Congestion Worldwide, www.tomtom.com/en_gb/trafficindex/#/list.

There is an inclination to attribute the majority of the increase in scheduled bus travel time to normal traffic conditions. However, the WRCS indicates that traffic conditions are not as significant a cause of increased bus travel times as suspected. In fact, the actual travel time was often longer than scheduled even though the scheduled time has included significant expected delay time. Most scheduled travel time is consumed by passenger loading activity and traffic related delays as quantified below.[9]

Figure 14 Factors Causing Delays on Route 8[10]

Passenger loading time

- Normal loading time
- Payment delay time
- Information delay time
- Bicycle or wheelchairs

Traffic delay

- Traffic controlled intersections
- Vehicle queue
- Pedestrians in crosswalks or other related delays
- Bus stop blocked

Vehicle Running Time

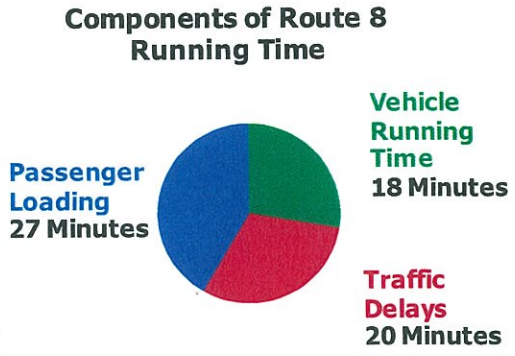


Figure 14 allocates Route 8 average round-trip travel time during peak conditions into the passenger loading, traffic delays and vehicle run time.

Travel time delays were more pronounced on the Route 8 than the system's total would suggest, and more so than might be indicated by comparing recent shedules. In 2015, the route required an average of 69 minutes to complete a round trip.[10] Moreover, schedule adherence reports indicate that often the route runs late. The WRCS found that the route was only on-time about 65 percent of the time, suggesting a dynamic schedule increase efficiency over a fixed time schedule.

Table 4 Comparison of in Scheduled Run Times for Route 8

Route Segment	Weekday Schedule Comparison (in minutes)	
	1992	2012
Westbound: Waikīkī to Ala Mānoa Center	24	29
Eastbound: Ala Moana Center to Waikīkī	20	36
Roundtrip: Without Recovery Time	44	65

[9] Waikīkī Regional Circulator Study, 2013.
[10] Source: Waikīkī Regional Circulator Study, 2013

4 PROJECT DESCRIPTION

The HUB is part of a multi-year planning effort by the City in partnership with HART to establish high-frequency/high-capacity bus service that transports rail passengers to jobs to these neighborhoods including the Capital District, Ala Moana, Makiki, Waikīkī, and UH Mānoa.

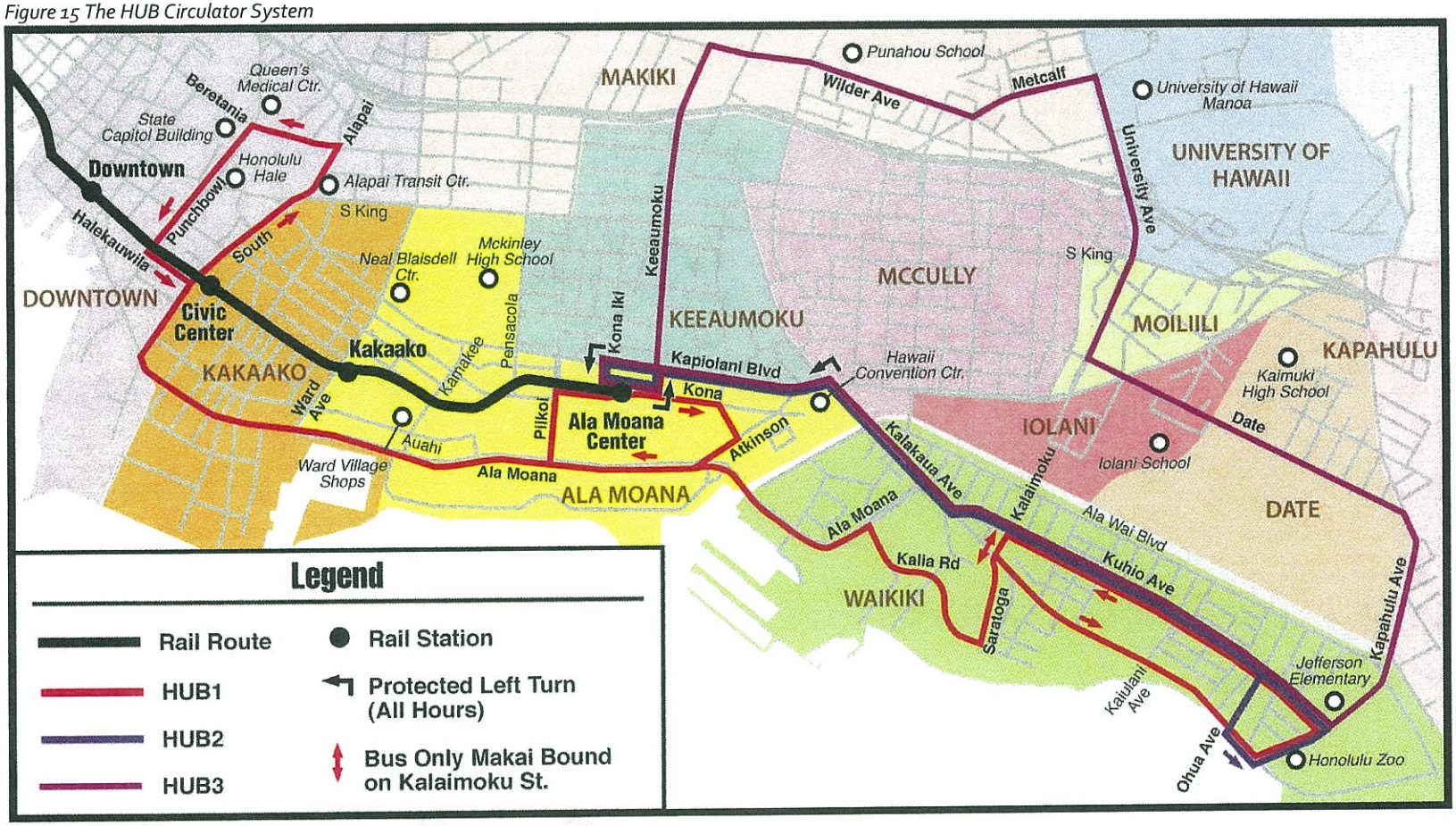
The HUB will be a system of three high-frequency, rapid service routes:

- *Kaka'ako Circulator (HUB 1)* — connects Kaka'ako and Waikīkī via Ala Moana Center and serves two key HART rail stations: Civic Center Station and Ala Moana Center Station
- *Waikīkī Circulator (HUB 2)* — connects Ala Moana Center and Waikīkī via the Hawai'i Convention Center and serves HART's Ala Moana Center Station
- *Makiki-UH Mānoa-Waikīkī Circulator (HUB 3)* — connects Ala Moana Center, Makiki, UH Mānoa, and Waikīkī in a two-way loop

The HUB will improve mobility through urban Honolulu's most congested neighborhoods through three over-arching strategies:

1. **Circulator Buses:** Specially-branded all-electric buses with all-door passenger boarding and alighting, luggage storage, and digital passenger information system along three routes
2. **Dynamic Scheduling:** Cloud-based automatic vehicle location and monitoring system (AVL/AVM) and continuous automatic location-based real-time controls, which will ensure even spacing of frequent HUB service and eliminate bus bunching.
3. **Enhanced Infrastructure:** Advanced transit-priority traffic signals including transit-priority signals such as queue jumpers combined with transit-exclusive right-of-way at key locations. Bus stops will also be enhanced with improved signage and wayfinding information, and real-time information system.

Figure 15 The HUB Circulator System



4.1 Circulator Buses

Routing Strategy

The proposed HUB circulator system is rooted in the FHWA-funded Waikiki Regional Circulator Study (WRCS) and reflects evolving plans in rail system designs and land use planning in Honolulu. Plans for HUB incorporate recommendations from prior studies and implement relevant solutions for continuing and evolving problems in Honolulu's urban core. The WRCS contemplates a high-capacity bus connection to planned rail stations in Ka-ka'ako and Ala Moana; the HUB circulator is the result and culmination of years of study that focused on residential, employment, and tourist needs relating to transit and connectivity in Honolulu. All routes were tested against the following set of evaluation guidelines:

- Operational by 2019 - 2020
- Capacity for peak period rail demand
- Supports Waikīkī Transportation Strategy
  - Achieves the "Pedestrian-First" policy
  - Maintains our "Hawaiian Sense of Place"
  - Invigorates our economic vitality
- Solutions are cost-effective and affordable
- Solutions are based on community outreach
- Solutions are highly reliable

HUB will provide fast and frequent service to major employment centers, government services, residential areas, resorts, and educational destinations in Honolulu's urban core, including major transit hubs and key rail stations. The map in Figure 15 illustrates each HUB route.

The HUB circulator routes are designed to operate continuously without the need for terminal stops and long recovery times. Any passenger can get on a route at any point and travel in the most convenient direction without encountering layovers of up to 15 minutes. This continuously looping bus circulator reduces operating costs and eliminates layover curb space and turnaround loops through neighborhoods. This reclaimed on-street area may then be used to support adjacent land-use through parklets, or to enhance other modes of transportation (e.g., bicycle corrals).

Continuous operations: Operations are focused on Ala Moana Center where the eastern terminal station for rail is located. Operators may periodically exit the circulator vehicles at the Ala Moana Center, but the buses will continue with another operator by staggering drivers. This approach will minimize the number of vehicles needed for operations by minimizing layover time and space for vehicles. This approach also keeps vehicles in motion and operations, maximizing efficiency and duty cycles of vehicles.

The HUB Routes

The following section provides specific turn-by-turn descriptions.

HUB 1 (Downtown-Ala Moana-Waikīkī) will provide corridor service between Downtown Honolulu's Civic Center and Waikīkī via Ala Moana Center and Fort DeRussy. Additionally, it will connect the following major destinations in Honolulu's Civic Center to HART's Civic Center Station: Alapai Transit Center, Frank Fasi Municipal Building, Honolulu Police Department, Queen's Hospital, State Department of Health, State Capitol, Main Library, and the Historic Missionary District.

***Ala Moana-Waikīkī-Downtown-Ala Moana*:** From Kona/Kona Iki serving HART's Ala Moana Center Station, eastbound on Kona, right Mahukona, right Atkinson, left Ala Moana Boulevard, right Kalia, left Saratoga, right Kalakaua, left Kapahulu, left Kuhio, left Kalaimoku (using proposed transit-exclusive priority left turn signal and transit-exclusive lane), onto Saratoga, right Kalia, left Ala Moana, right South to service HART's Civic Center Station, onto Alapai to service Alapai Transit Center, left Beretania (using proposed transit-exclusive queue jumper priority traffic signal), left Punchbowl, left Halekauwila to service HART's Civic Center Station, right South (using proposed transit-exclusive right turn signal and transit-exclusive lane), left Ala Moana Boulevard, left Piikoi, right Kona to Kona/Kona Iki, serving HART's Ala Moana Center Station.

HUB 2 (Ala Moana-Waikīkī) will provide corridor service between HART's Ala Moana Center Station and Waikīkī. HUB 2 will accept the majority of passengers coming from and destined to Honolulu International Airport.

Ala Moana-Waikīkī-Ala Moana: From Kona/Kona Iki, serving HART's Ala Moana Center Station, eastbound on Kona, left Keeaumoku (using proposed transit-exclusive priority left turn signal), right Kapiolani, right Kalakaua, onto Kuhio, right Ohua, left Kalakaua, left Kapahulu, left Kuhio, onto Kalakaua, left Kapiolani (using proposed transit-exclusive priority left turn signal), left Kona Iki (using proposed transit-exclusive priority left turn signal), left Kona to Kona/Kona Iki, serving HART's Ala Moana Center Station.

HUB 3 (Ala Moana-Makiki-UH-Waikīkī) will provide bi-directional service in two loops connecting Ala Moana with Makiki, UH Mānoa, and Waikīkī. This route will connect the high-density Makiki residential corridor with rail service, UH Mānoa, and Waikīkī.

Clockwise Loop, Ala Moana-Makiki-UH-Waikīkī-Ala Moana: From Kona/Kona Iki, serving HART's Ala Moana Center Station, eastbound on Kona, left Keeaumoku (using proposed transit-exclusive priority left turn signal), right Wilder, left Metcalf to service UH Mānoa, right University, left Date, right Kapahulu, right Kuhio, onto Kalakaua, left Kapiolani (using proposed transit-exclusive priority left turn signal), left Kona Iki (using proposed transit-exclusive priority left turn signal), left Kona to Kona/Kona Iki, serving HART's Ala Moana Center Station.

Counter-Clockwise Loop, Ala Moana-Waikīkī-UH-Makiki-Ala Moana: From Kona/Kona Iki serving HART's Ala Moana Center Station, eastbound on Kona, left Keeaumoku (using proposed transit-exclusive priority left turn signal), right Kapiolani, right Kalakaua, onto Kuhio, left Kapahulu, left Date, right University to service UH Mānoa, left Metcalf, right Wilder, left Keeaumoku, right Kapiolani, left Kona Iki (using proposed transit-exclusive priority left turn signal), left Kona to Kona/Kona Iki, serving HART's Ala Moana Center Station.

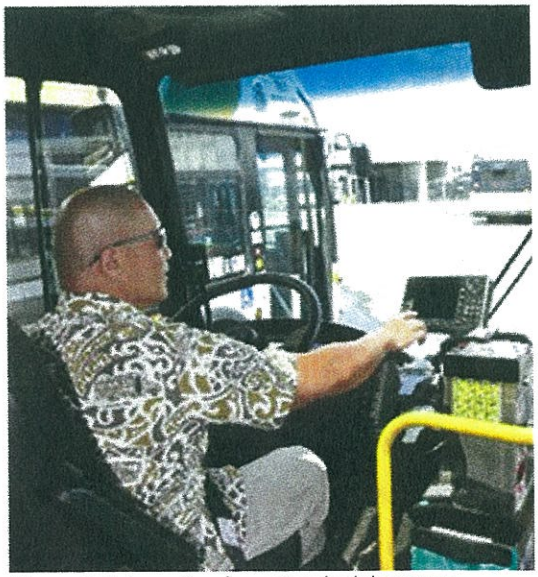


Figure 16 Driver using dynamic schedule system

4.2 Dynamic Scheduling System

Honolulu has the third-worst traffic congestion in the nation. It is difficult to predict traffic conditions in a consistent manner, which adds difficulty to standard fixed-route scheduling between two termini.[11] Bus bunching occurs

[11] TomTom International BV, TOMTOM Traffic Index, Measuring Congestion Worldwide, www.tomtom.com/en_gb/trafficindex/#/list.

when traffic or long boarding and alighting times stall some buses but not others. Consequently, some buses are delayed, forcing passengers to endure long gaps in service only to find multiple vehicles arriving at once.

The three HUB routes will use a dynamic scheduling system that prevents bus bunching. This cloud-based technology will adjust bus schedules in real time with consideration for traffic congestion, unusually heavy ridership and special events, such as parades. Drivers will be given on-board instructions to maintain proper spacing and time interval between buses. Low-cost, non-proprietary tablets will allow for real-time updates of driver work assignments and enhance communication to drivers through smart phone applications. The system will be synchronized with train arrival times to maximize customer convenience.

Dynamic scheduling will focus on the Ala Moana Transit Center, adjacent to the future Ala Moana Center Station. Buses will synchronize with train arrivals in real time.

In order to prevent driver fatigue, drivers will be able to take a short break after a complete cycle as they would at a bus terminal. Another driver will take over the route so the bus does not have to park. The first driver will then fall back one or two buses and receive an appropriate rest period to prevent fatigue.

4.3 Enhanced Infrastructure

Enhanced infrastructure and traffic engineering will improve system safety and speed up route travel.

Transit-exclusive turn movements

Limit turns to transit vehicles only. They may be implemented on a time-specific basis.

1. **Kalākaua Avenue and Kapi'olani Boulevard Intersection:** PM City Bus only left turn lane. Requires bus detection system.
2. **Kapi'olani Boulevard and Kona Iki Street Intersection:** Adding a left-turn phase light to facilitate safe turning movements by City buses into the Ala Moana Center and the Ala Moana rail station. This may require a bus detection system.
3. **Kona Street and Ke'eaumoku Street Intersection:** Add a bus-only traffic signal to allow a bus-only left turn within the Ala Moana Center. This may require a bus detection system.
4. **Kuhio Avenue and Kalaimoku Street Intersection:** Kuhio Avenue northbound left onto Kalaimoku Street
5. **Halekauwila Street and South Street Intersection:** Halekauwila Street eastbound right onto South Street

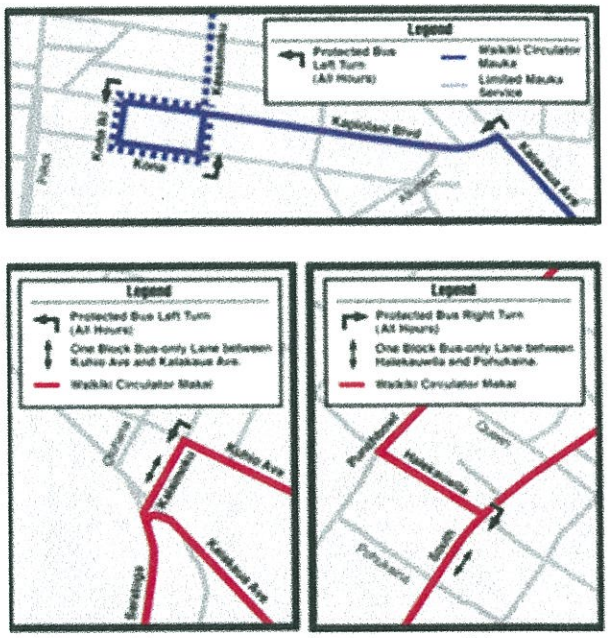


Figure 17 Traffic Engineering Enhancement Detail (top: 2a-c; bottom left: 2d; bottom right: 2e)

Transit Signal Prioritization

1. **Transit queue jumper at the Alapai Transit Center**: Allow transit vehicles a priority phase of green signal before other traffic proceeds at Alapai Street northbound left turn onto Beretania Street from the curbside right lane.

Dedicated Transit Lanes

"DEDICATED TRANSIT LANES...ENSURE THAT THE TRANSIT VEHICLE EXPERIENCES MINIMAL WAIT TIME AT INTERSECTIONS AND CAN MOVE FREELY REGARDLESS OF TRAFFIC CONGESTION, PROVIDING A PASSENGER EXPERIENCE COMPETITIVE WITH DRIVING."

-Adapted from the Urban Street Design Guide, published by Island Press (NACTO, 2013).

Access to dedicated bus lanes can be restricted to public transit buses only, or can be shared with bicycles, or may be made available to all vehicles carrying over 14 passengers. Lanes may be implemented on a time-specific basis or 24/7/365.

1. **Kalaimoku Street Conversion:** Convert Kalaimoku Street westbound between Kuhio Avenue and Kalakaua Avenue. Eliminate two turning movements by restricting makai-bound lane to buses only (public and private buses).
2. **South Street Conversion:** Convert South Street to two-way operation between Halekauwila Street and Pohukaina Street. Halekauwila Street is already two-way from Ala Moana Blvd to Pohukaina Street.

Bus Stop Zone Improvements

Figure 18 Route and schedule signage at bus stops

- **All-door boarding of circulator buses:** All-door boarding will significantly reduce dwell time and decrease a customer's journey time. Smart card readers will be installed at all doors. All-door boarding is expected to improve trip running times by at least 15 percent.
- **On-street ticket vending machines (TVMs):** TVMs will be installed at the busiest resort bus stops and tourist destinations and integrated into the City's planned account-based smart card system for both bus and rail.
- **Bus Stop Consolidation**
- **Wayfinding**: HUB-specific wayfinding, real-time information at bus stops, and on-board information systems will improve the passenger experience.

Vehicle Enhancements

- **Luggage storage and accessibility:** Buses will accommodate standard-sized baggage for customers transferring from the HRTP connecting to the Honolulu International Airport. Wide aisles and thoughtfully arranged seating plans will maximize in-vehicle space to support peak and off-peak loading patterns.
- **Themed branding**: Buses will be easy to identify for passenger service and will stand out from the standard transit system livery.
- **Mobility device ramps:** HUB vehicles will allow mobility device access at both the front and middle doors. Suitable stowage areas will be provided near both ramps.

- **Wi-Fi and USB ports**: HUB vehicles will provide onboard amenities for wireless internet access and re-charging cell phones or tablets.
- **Zero-emission All-Electric Vehicles:** The HUB buses will utilize a full fleet of zero-emission buses Buses will use lower weight materials and operate with high-technology features. Zero-emission buses are currently in limited use nationally. The City can collect evidence-based data of electric bus use under rigorous duty cycles, which will benefit other municipalities interested in electric bus use.

Electric Vehicle Infrastructure

Hawaiian Electric Company (HECO), Hawaii's electric utility, will finance infrastructure for rapid-charging stations and consider lowering rate tariffs to improve operating costs.

Figure 19 Electric Bus with Rapid-Charging Station

5 PROJECT PARTIES

The City and County of Honolulu is the applicant for this grant. All of the infrastructure improvements in this grant are within the jurisdiction of the City and County of Honolulu.

The HUB is supported and guided by an extensive group of collaborators including City, State, and Federal agencies, area non-profits, businesses, community organizations, and institutions.

Many City departments are key participants in the planning phase and fully support the infrastructure improvements for the HUB Circulator Project. Officials from relevant City and State departments meet regularly with DTS, OTS, and HART to discuss interim and future bus-rail integration, multimodal transportation, and TOD to identify bus and paratransit service and infrastructure needs as rail is phased into the City's transportation network. This working group will ensure that high capacity, continuous bus service provided by the HUB runs smoothly.

6 GRANT FUNDS AND SOURCES/ USES OF PROJECT FUNDS

City Council is currently reviewing the submitted balanced FY17 Capital Improvement Program (CIP) budget. As a result, the City Administration is committed to include the project's local share in the future FY18 CIP budget. This application proposes an 80-20 Federal-Local match.

Table 5 Estimated HUB Project Costs

Preliminary Estimated Project Cost	No.	Unit Cost	Total Share	Tiger Fed Share	Local Share
All-Electric Battery Articulated Buses	18	$1,200,000	$21,600,000	$17,280,000	$4,320,000
Bus Stop Improvements			$4,626,540	$3,701,232	$925,308
Traffic Engineering Improvements			$4,000,000	$3,200,000	$800,000
Dynamic Scheduling System			$1,500,000	$1,200,000	$300,000
Wayfinding			$200,000	$160,000	$40,000
Total			**$31,926,540**	**$25,541,232**	**$6,385,308**
Percent			**100.0%**	**80%**	**20%**

The City has a well-established record of supporting transit investments. Table 6 lists projects related to the HUB project that are being fully financed without TIGER funds. In addition, the Transportation Improvement Program (TIP) includes the purchase of 80 buses from FY15 to FY18.

Table 6 Estimated or Budgeted Ancillary Project Costs

Project Cost	No.	Unit Cost	Total Cost	Funding Source
Waikiki Catalytic Bus Improvement Project			$1,000,000	City
Develop Ala Moana HUB Transit Plaza			$24,600,000	City
Install Rapid Charge Stations at Alapai TC	8	$20,000	$160,000	HECO
Total			**$25,760,000**	

7 PRIMARY SELECTION CRITERIA

7.1 Quality of Life

The HUB will improve the quality of life for commuters by providing convenient and reliable transportation. Resident workers who often travel up to two hours each way to service jobs in Waikīkī will be most impacted. Together with the HRTP, the HUB will reduce the travel time for many residents by half over the current local bus system, and allow them to spend more time with family and improve their quality of life. As noted earlier, nearly 70 percent of commuters that travel within a half mile of the HUB are minorities and 16 percent of these passengers come from communities where 15 to 60 percent of households fall below the poverty line. Improved mobility to jobs and education for these commuters will greatly improve the quality of life.

The HUB is one of several projects developed by the City to improve livability in Honolulu. In 2016, a regional bike share will be initiated. The City recently opened its first protected cycle track bicycle lane and additional links are planned. The City has worked with each community to develop TOD neighborhood plans around each station and is actively implementing these plans through upzoning and complete streets legislation.[12] The HUB contributes to these projects by improving station access and mobility to complete the last mile connection to rail.

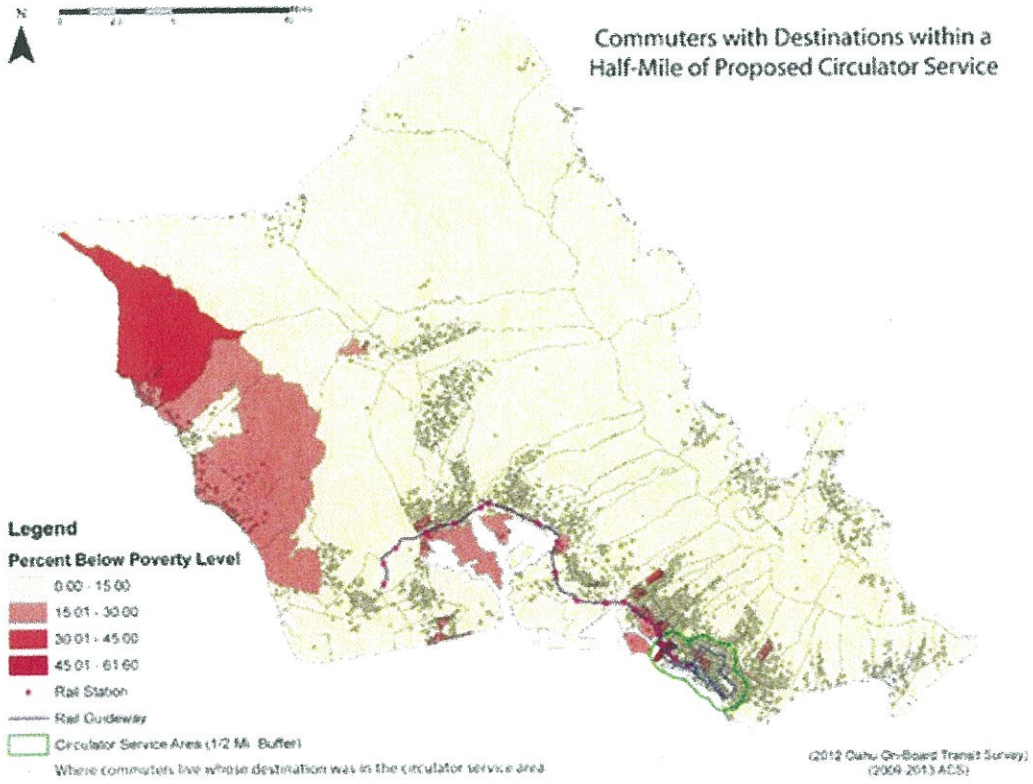


Figure 20 Poverty Levels for Commuters with destinations within a half mile of the HUB

[12] City and County of Honolulu web site at http://www.honolulu.gov/tod/about-tod/dpp-tod-faqs.html

Ladders of Opportunity

The HUB improves mobility for minorities and economically disadvantaged communities. The HUB will link people to jobs, health care, and educational opportunities and will provide a crucial link between the rail system and Waikiki, one of Oahu's largest employment centers. Integrating the HUB with the HRTP will create a more viable transit system for visitors as well as for residents in Honolulu. Both services will be high-frequency and high-capacity. However, the HRTP will provide regional service, while the HUB will provide local service to a user's final destination.

Much of the HUB users will likely be minority, economically disadvantaged, and/or transit dependent. Figure 20 summarizes the demographic characteristics of current bus riders.

Key Demographic Statistics

- Approximately 16 percent of commuters with destinations within a half mile of the circulator service came from communities with high levels of poverty.[13] In addition, the HUB drastically increases the level of service through the Civic Center area. More than 55 percent of Civic Center area residences live below poverty level.[14]
- Approximately 36 percent of existing bus users whose destination were within a half mile of proposed circulator service had an income below Honolulu's per capita income.[15]
- Nearly 70 percent of bus users that traveled within a half mile of the HUB were of an ethnicity other than White.[16]
- Of the existing bus users in the HUB catchment area, 7 percent of used a disability pass, 9 percent of commuters used a senior pass, 18 percent of commuters used a student pass.[17].

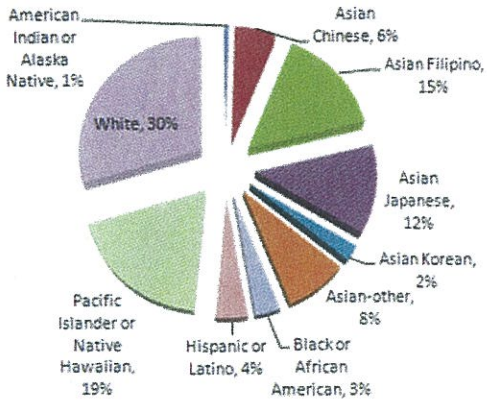


Figure 21 Demographics of Existing Bus Riders with HUB destinations (Source: Onboard Survey)

The HUB will offer a cost effective travel alternative to many of Honolulu's city services. Commuters using the service will have increased access to shopping centers, employment areas, and parks/outdoor places. Survey information also points out that 33 percent of people traveling into the circulator service area do not own a car.[18] In 2013, the percent of people in Honolulu with no vehicles available at their household was 10.7 percent, around 22 percent less than commuters traveling into the service area.[19]

[13] Source: Onboard Survey, 2012
[14] Source: Appendix V Table 2.
[15] Source: Appendix V Table 3.
[16] Source: Appendix V Table 4.
[17] Appendix V Table 6.
[18] Source: Appendix V Table 5.
[19] Source: U.S. Census Bureau: 2013 American Community Survey 1-Year Estimates (DP04- SELECTED HOUSING CHARACTERISTICS)

7.2 Economic Competiveness

The HUB supports Hawaii's economy by improving the visitor experience and enhancing mobility for the work-force to Waikiki and other employment centers like Civic Center, Downtown and UH Mānoa. Hawai'i's current economic growth and standard of living is heavily reliant on tourism. While there are emerging markets, such as technology and film, tourism will continue to be a Hawaii's primary economic generator.[20] Waikīkī accounts for 6.5 percent of Hawai'i's Gross State Product and 7.9 percent of State tax revenue.[21] While Waikīkī remains a world class resort destination, online travel sites and annual visitor satisfaction polls spearheaded by the Hawaii Tourism Authority cite traffic congestion as intolerable. In a recent 2013 report, visitors complaints about traffic congestion were the second most common negative comment barely beating complaints about Hawai'i's high costs.[22] If Honolulu does not ameliorate this problem, tourist could potentially choose to patron other resort locations.

About 10 percent of Hawai'i's fixed route ridership, or 25,000 unlinked trips per day, is composed of visitors. The HUB will enhance Waikīkī's economic vitality by providing more frequent and faster transit to visitors destined to the HRTP and visitor attractions in central Honolulu. Its close integration with rail ensures visitors a seamless last mile connection from Honolulu International Airport.

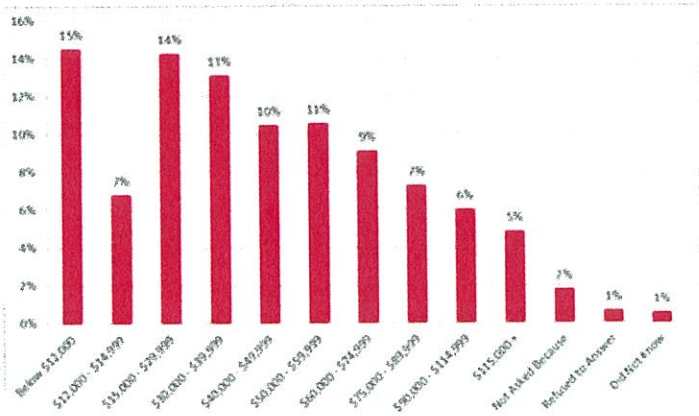


Figure 22 Income for Commuters with Destinations within a Half Mile of the HUB

7.3 Environmental Sustainability

Reduced Vehicle Miles Traveled

The HUB integrates environmental principles by reducing vehicle miles traveled (VMTs) and utilizing a fleet of clean all-electric battery buses. The integration of rail with convenient, high capacity bus service allows passengers the opportunity to access their desired destination without a car, thereby reducing VMTs.

Reduced Dependence on Foreign Oil and Reduced Carbon Emissions

The HUB will reduce dependence on foreign oil, and reduce carbon emissions. Ultimately, all electricity used by the HUB will come from clean sources. The Hawaii Clean Energy Initiative sets the goal of achieving 100% clean energy by 2045. Initially, some or all of the electricity used to power the all-electric battery buses used in the HUB will come from excess renewable energy generation. Because Hawaii has the highest concentration of roof-top solar in the country, HECO has surplus power available from solar power generation. Buses will absorb energy created during the day by Hawaii's well utilized renewable energy market and run during peak transit

[20]Department of Business, Economic Development & Tourism, Hawai'i Sustainable Tourism Project, www.dbedt.Hawai'i.gov/visitor/sustainable-tourism-project/overview.

[21] Waikīkī 20/20 – Economic Contributions, Richard Lim, Director, Department of Business and Economic Development and Tourism, 2012. See http://files.Hawai'i.gov/dbedt/speeches/2012-10-16-Waikīkī-final.pdf.

[22]2013 Visitor Satisfaction and Attraction Report, Hawai'i Tourism Authority, p 32 http://www.Hawai'itourismauthority.org/default/assets/File/reports/visitor-satisfaction/2013%20VSAT%20Report%20Final.pdf.

hours. This operational strategy aligns with current efforts to shift power demand to periods where there is excess solar or wind power generation.

7.4 State of Good Repair

The vehicles purchases as part of the HUB project will help improve the condition of TheBus's fleet overall. Honolulu's bus fleet is older than common industry standards. For 2015, the overall average age of the fixed route (MB) bus fleet is 10.44 years. The average age of the articulated bus sub fleet is 10.74 years. Although the City anticipates annual bus and van purchases around $20 million for the next five years, that pace of purchasing will not drive down the average age of buses to industry norms of seven to eight years old. Currently, there is a backlog of 195 buses that have exceeded FTA's Minimum Useful Life standard. There are 98 buses in the fleet that have exceeded 16 years of life.

7.5 Safety

Any project that shifts automobile trips to transit will result in a safer environment overall. In order to ensure safety, the HUB includes the following:

- All buses will have video surveillance systems to enhance safe driving and security of passengers.
- Along the route, certain traffic engineering measures will be taken to reduce the number of turning movements for bus vehicles and to provide several protected left-turns.
- The interior of buses will be configured in anticipation of many standing passengers with enhanced holding straps and padded stanchion bars.
- The electric propulsion system will be programmed to accelerate at a safe rate. The absence of shifting points will provide a smoother ride to customers.
- Buses will be equipped with a forward facing anti-collision warning system.

8 SECONDARY SELECTION CRITERIA

8.1 Innovation

Dynamic Scheduling System

Dynamic scheduling, a two-way circular route, and the integration of electric battery buses are innovations that are applicable to other transit systems. The dynamic scheduling system is based on a cloud-based monitoring system continuously monitoring all buses on the route and dynamically spacing the buses based on traffic and passenger conditions. The system is integrated with the rail control system so buses at train stations may be held for up to three minutes to accommodate arriving rail passengers with departing buses. TheBus has begun a pilot program to test such an operational strategy on the Route 8 using a system developed by Via Analytics.[23] Arrival times will be displayed in real time on digital displays, smart-phone apps and on the web. [24] The City has tested about 30 solar-powered displays for the past six months in cooperation with the Ulupono Initiative non-profit.[25]

Continuous Route Operations

A second innovation is the development of circular loop routes with two-way operations. Within a major urban area such as the Downtown to Ala Moana to Waikīkī to UH Mānoa to Makiki to Ala Moana area, there are multiple attractions. Having conventional bus routes with terminal points requires customers to transfer or wait through lengthy recovery periods. However, if the route operates continuously, customers can get on anywhere within the loop and choose the most direct direction to get to their destinations quickly. The concept is similar to a Downtown People Mover such as the Miami Metromover but with rubber tired vehicles operating on ground level streets. Drivers will periodically be relieved by other drivers to guard against fatigue. Such operations are common in rail transit and the practice is called a "fall-back operator" procedure. It is believed that many larger transit systems could adopt such a people-mover route.

By operating buses continuously, a given route can be operated with fewer buses. For example, the HUB routes described here will require 19 buses. However, if it operated as a conventional route with a fixed schedule, it would require 22 buses. The savings are more than $3 million dollars in reduced capital funding.

In addition, by operating buses continuously, there is less need for fixed terminal facilities where buses can wait and turn around. The Waikīkī Regional Circulator Study recommended fixed facilities at Honolulu Zoo and in the Army-owned Fort DeRussy. Prime land values in Central Honolulu are up to $1,000 per square foot. The opportunity cost of the real estate for a bus storage and turn-around loop for buses would be in excess of $50 million, making the siting of the fixed terminal facility in Waikiki cost prohibitive.

Vehicle-To-Grid (V2G) Technology

Hawai'i has high electricity rates and the highest concentration of roof-top solar in the country.

THE HUB'S ALL-ELECTRIC BUSES WILL ACT AS BATTERY STORAGE WHEN SOLAR POWER GENEARTION IS HIGHEST

[23] Via Analytics was founded to address inefficiencies that commonly exist in mass transit systems. One important example is the phenomenon referred to as bus bunching where the passenger waits an excessive time

[24] DaBus - http://www.honolulu.gov/mobile/dabus.html

[25] http://ulupono.com/portfolios/waysine. Ulupono is a Hawai'i-focused impact investing firm that uses for-profit, non-profit and social investments to improve the quality of life for island residents in three areas: locally produced food; clean, renewable energy; and waste reduction.

8.2 Partnership

This application is being submitted in partnership with the following agencies and organizations.

- The Honolulu Authority for Rapid Transportation http://www.honolulutransit.org/hart.aspx
- Oahu Transit Services, Inc. http://www.thebus.org/
- The Hawaiian Electric Company http://www.Hawaiianelectric.com/portal/site/heco

The application has been endorsed by a number of private and public institutions including the following:

- State of Hawaii, Department of Transportation
- The Waikīkī Improvement Association http://www.Waikikiimprovement.com/
- Hawai'i Clean Energy Initiative http://www.Hawaiicleanenergyinitiative.org/about-the-Hawaii-clean-energy-initiative/organizational-structure/
- The Blue Planet Foundation https://blueplanetfoundation.org/
- Energy Excelerator
- Move Oahu Forward
- Hawaii State Energy Office
- Hawaii Pacific University
- University of Hawaii
- Honolulu Clean Cities

9 RESULTS OF BENEFIT-COST ANALYSIS

A complete description of the Benefit-Cost Analysis is provided in Appendix III. Table 7 summarizes the BCA monetized findings. Annual costs and benefits are calculated over a 14 year period, which coincides with the minimum useful life for the buses in the project. It is likely that benefits will continue for a longer period. With a 7% discount rate, net benefits of almost $100 million are achieved. The BC ratio is 4.3.

Table 7 Overall Result of Benefit Cost Analysis in 2016Dollars

Project Evaluation Metric	Not Discounted	3% Discount Rate	7% Discount Rate
Total Benefits	$165,698,472	$127,763,687	$92,644,382
Total Costs	$31,926,540	$30,249,354	$28,222,150
Net Benefits	$143,425,012	$106,613,287	$72,853,606
Benefit Cost Ratio	**4.2**	**3.2**	**2.3**

The HUB will provide more than 30,000 daily riders[26] with access from the Honolulu rail project to important destinations within the Kakaako-Ala Moana-Waikiki-Makiki-University of Hawaii areas. Such large ridership means that a small increase in travel time results in a large travel time savings.

The project is designed to improve travel for the last mile upon arrival at the eastern terminal of the HRTP. The HUB intends to increase bus travel speeds by 33% (from about 6 mph to about 8 mph) through various low-capital cost traffic engineering improvements. It will also provide more direct transit link from Ala Moana to Waikiki for a majority of riders eliminating about 0.7 miles of circuitous bus travel. Without this project, commuters traveling to Waikiki could spend more time on the last 2 miles of bus travel than the first 20 miles of rail.

The HUB will improve safety, quality of life, environmental sustainability and improve economic competiveness along the most congested and dense corridors of Oahu. The routing for the HUB routes has purposely been designed to support regional mobility for underserved neighborhoods within the Date Street, Keeaumoku, McCully and Makiki neighborhoods. These areas have significantly more people in poverty than Oahu as a whole. The Mauka-Makai Circulator routing will significantly improve mobility for these populations.

The HUB will allow for a rationalization of bus transit services and an annual savings in transit operating costs. The proposed circulator system provides substantially more transit capacity to circulator areas and allows for the redeployment of bus services to other parts of the island. The number of trips offered in the circulator area will total 568 daily one-way HUB vehicle trips. These new routes will also allow for the net reduction of 443 other vehicle trips in the area. Overall, daily seat capacity will increase by almost 8,000 seated passengers and crush capacity will increase by about 12,500 passengers. The higher capacity at lower cost is possible both because of the higher operating speeds and the use of more high capacity vehicles in the area. The extra transit capacity will accommodate the projected additional ridership forecast for the circulator area as a result of the new rail system. Operating cost savings will be in excess of $1,000,000 per year as a result of the route rationalization. This is important to the region. The combination of rail and bus will increase overall costs of transit to the City and County of Honolulu. The City must find creative ways to maintain bus service capacity while taking full advantage of the opportunities for operating cost savings.

[26] For purposes of the Benefit-Cost Analysis, HART's regional travel demand forecasting model forecasts were used. See Section 3.1 for a discussion of ridership estimates

10 PROJECT READINESS

10.1 Environmental Clearances

The HUB will not cause any significant environmental impact and are consistent with the criteria associated with FTA categorical exemptions under CFR Part 771.118(c)(5). This section provides a categorical exemption to "Activities, including repairs, replacements, and rehabilitations, designed to promote transportation safety, security, accessibility, and effective communication within or adjacent to existing right-of-way, such as: the deployment of Intelligent Transportation Systems and components; installation and improvement of safety and communications equipment, including hazard elimination and mitigation; installation of passenger amenities and traffic signals; and retrofitting existing transportation vehicles, facilities or structures, or upgrading to current standards."

10.2 Public Participation Process

An extensive public participation process was involved in the development of the Waikīkī Circulator Study.

Waikīkī Transportation Stakeholder Oversight Committee

An oversight committee consisting of representatives from 23 organizations was formed to guide the study. Participants included private and public transportation providers, representatives from resident associations, the visitor industry, large land owners and representatives from other government agencies. The Committee held quarterly meetings and is still active. The Committee will monitor and guide the implementation of the circulator system.

Outreach to the Community

A robust public outreach program was conducted as part of the Waikīkī Regional Circulator Study. Five Neighborhood Boards were given two briefings on the study. In addition, two public workshops were held in cooperation with the Waikīkī Neighborhood Board. The WRCS workshops were widely advertised at many area bus stops. Notices were posted on City buses and included in the April 20, 2012 issue of the Honolulu Advertiser. Additionally, two targeted group workshops were held in Cooperation with the Hawai'i Transportation Association and targeted private transportation providers and freight delivery services.

Figure 23 WRCS Stakeholder Engagement

10.3 Previous Planning Studies

Honolulu High-Capacity Transit Corridor Project (HHCTCP)

The HHCTCP Environmental Impact Statement assumes that bus service between the terminal station and Waikīkī.[27] Subsequent conceptual designs identified on-street bus positions along Kona Street similar to current operations.

Waikīkī Regional Circulator Study

The *2013 Waikiki Regional Circulator Study (WRCS)*, a $400,000 study that was 80 percent funded by the Federal Highway Administration (FHWA), reflects evolving plans in rail system designs and land use planning in Honolulu. Plans for HUB incorporates recommendations from historic and previous studies such as the WRCS and implements relevant solutions for continuing and evolving problems in Honolulu's urban core. The WRCS contemplated a high-capacity bus connection to planned rail stations in Kaka'ako and Ala Moana; the HUB circulator is the result and culmination of years of study that focused on residential, employment, and tourist needs relating to transit and connectivity in Honolulu.

Recognizing the need for a plan to provide bus service to Waikīkī and the adjacent regions after the implementation of the rail project, the City commissioned a study to define and plan for a Regional Circulator bus system serving the area. The study made several recommendations for a circulator system.

Service and Operations – Redesign bus service for greater effectiveness and efficiency. This was estimated to reduce bus needs from 16 buses to 12 buses. The study envisioned two off-street transit centers in Fort DeRussy—a military facility under the jurisdiction of the U.S. Army and at Kapi'olani Park adjacent to the Honolulu Zoo parking area.

Fare Collection – The study recommended that pre-boarding fare payment be established along Waikīkī bus stops using ticket vending machines. This allow for all-door boarding, which would reduce dwell time at bus stops.

Stop Locations – The study recommended consolidating some bus stops to improve running speeds and to avoid capacity problems causing delays.

Information and Wayfinding – The study recommended a coordinated way finding and real-time information displays.

Running Way – The study recommended various traffic engineering techniques to extend transit priority areas. These included special pavement markings, traffic signal improvements, and the conversion of Kalaimoku Street to two-way operation for buses.

Vehicles – Acquire reliable high capacity buses to replace the current 40' buses used on Route 8. These buses will be specially outfitted to better accommodate luggage since the rail system will have an airport stop and will allow luggage on trains.

Livability – The study recommended a variety of techniques to improve the livability of Waikīkī including measures to enhance the pedestrian experience.

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[27] Honolulu High Capacity Transit Corridor Project, Final Environmental Impact Station/Section 4(f) Evaluation, City and County of Honolulu, June 2010. http://www.honolulutransit.org/document-library/eis.aspx

10.4 Related Projects

There are several related projects to the HUB Circulator bus system(see Table 8).

Table 8 Related Projects to the HUB Circulator System

Related Projects	Status	Estimated Completion Date	Total Cost	Federal TIGER Share	City Share	HART Share
Install new regional fare collection system	RFP issued June 2015	Bus - 2017; First Segment Rail 2018; Full System - 2019	$43 million	$0	$19 million	$24 million
Develop off-street transit center at Ala Moana Center	Land appraisals completed; In discussion with landowners	2019	Est. $24.6 million	TBD	TBD	TBD

The City, in cooperation with HART, is also planning an off-street transit center below the Ala Moana Center Station. HART is committed to completing a 30 percent design of the facility. The Ala Moana Center transit center will be the control point for the HUB circulator. Vehicle departures from the center will synchronize with rail arrivals ensuring fast, convenient departures. Funding sources for the proposed Ala Moana transit center are pending. In the event that it is not developed in time for the HRTP opening, HUB circulator buses will utilize curb parking along Kona Street similar to bus operations today.

Honolulu Rail Transit Project

The HRTP is a 20-mile, 21 station, elevated and fully automated light metro system, which hugs the southern coast of Oahu. The City and HART are working together to reconfigure bus routes that allow rail to act as the primary transit corridor with bus routes extending into the valleys, creating a hub and spoke system that allows for optimal mobility. The HUB leverages the benefits of rail and provides the last mile connection for passengers commuting as far as 30 miles away. The HRTP will be fully operational in 2019 with an interim opening in 2018.

Figure 24 HUB in relation to HRTP

Dynamic Scheduling Pilot Project

In 2015, TheBus began developing a dynamic scheduling system for the Route 8, which serves Ala Moana and Waikīkī. The HUB will replace this route. This pilot project can serve as a model for the HUB, and will demonstrate how cloud based real-time dynamic scheduling can reduce bus bunching, improve service, and reduce costs.

Multi-Modal Fare Collection System

The City, in cooperation with HART, is developing a plan for a regional fare collection system using an account-based architecture. The estimated total cost of this system is $43 million, of which the City share for the bus system alone is $19 million. A joint working group composed of City, OTS and HART officials has completed several years of planning for the new system. A request for proposals will be issued in June or July of 2015, with project rollout expected in 2017, and project completion slated for 2019. No TIGER Federal funding is being sought for this project.

Additionally, the City recently completed an integrated fare collection system study that will support both bus and rail. The system will be financed by both the DTS and HART. The projected cost of the entire system is $38 million including on-board bus equipment, rail station fare gates, and related retail and back-office equipment and systems. The bus system component is projected to be $19 million and will be locally funded. The project is a necessary component of the circulator project because of the need to support all-door boarding. No TIGER funding is being sought for this project, although the estimated bus system share is included in the overall project cost summary.

Ala Moana Rail Station Off-Street Bus Transit Center

The Ala Moana Center Bus Transit Center (AMCBTC) is an important component of the HUB Circulator System. Ala Moana Center is the most important transit center in TheBus network. Approximately 1,000 bus vehicle trips serve the shopping center each day and up to 50,000 unlinked transit trips have trip ends at the center or on adjacent roadways. The shopping center is an important transfer center for workers destined to jobs in Waikiki. Many hotel and related service workers have long bus commutes as parking is in short supply and is expensive. Many suburban bus routes terminate at Ala Moana. Parking and storage of terminating routes currently occurs along the Kona Street curb.

When rail transit reaches AMC in 2019, it will fundamentally change commute patterns. Nearly 23,000 passengers are projected to disembark from rail every weekday and an equal number will board. At peak times, a 4-car train will arrive at AMC every six minutes. The AMC station is projected to have almost three times as many passengers as the Downtown Station, the next largest. During the peak two-hour period, about 7,700 passengers are expected to exit rail.

The AMCBTC has been an integral part of rail transit planning for several years. The need for this project was recognized in the rail system EIS and supporting planning studies. DTS continued that planning with the WRCS.

Project planning for land acquisition and construction of a surface lot for an off-street transit center continues. HART is producing preliminary designs for an off street bus transit center adjacent to the Ala Moana Center rail station. The City has already budgeted $24.6 million over the next six years to acquire land and develop a transit plaza in the Ala Moana area, which will provide multi-modal connectivity to the Ala Moana Center rail station.

This application for TIGER funds does not include this transit center. Although the AMCBTC would greatly enhance the HUB, operations of the HUB are not dependent on the construction of this project. The HUB can utilize the existing bus stop and transfer facility at Ala Moana Center.

Waikiki Catalytic Bus Improvement Project

This project includes: (1) planning (including project feasibility analyses), design and construction of transportation improvements in and around Waikiki and connecting to adjacent neighborhoods and to the Ala Moana rail station; and (2) installation of enhancements (such as electronic information displays, fare payment systems, and pedestrian-friendly amenities) as identified in the 2013 Waikiki Regional Circulator Study.

10.5 Project Timeline

The HUB will be ready for procurement in 2018 with delivery of vehicles in the 2019-2020. The Full Funding Grant Agreement for the rail system provides that rail will be operational by December 31, 2020. All preconstruction engineering (traffic engineering, bus stop amenities, etc., will be completed by September 30, 2018. All funds will be expended by September 30, 2023.

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII
CERTIFICATE

RESOLUTION 16-77

Introduced: 03/22/16 By: ERNEST MARTIN – BY REQUEST Committee: TRANPORTATION

Title: RESOLUTION AUTHORIZING THE FILING OF A TRANSPORTATION INVESTMENT GENERATING ECONOMIC RECOVERY ("TIGER") GRANT APPLICATION WITH THE U.S. DEPARTMENT OF TRANSPORTATION ("USDOT") FOR THE HONOLULU URBAN BUS CIRCULATOR SYSTEM PROJECT

Voting Legend: * = Aye w/Reservations

03/31/16	TRANSPORTATION	CR-109 – RESOLUTION REPORTED OUT OF COMMITTEE FOR ADOPTION.
04/20/16	COUNCIL	CR-109 AND RESOLUTION 16-77 WERE ADOPTED. 8 AYES: ELEFANTE, FUKUNAGA, KOBAYASHI, MANAHAN, MARTIN, MENOR, OZAWA, PINE. 1 ABSENT: ANDERSON.

I hereby certify that the above is a true record of action by the Council of the City and County of Honolulu on this RESOLUTION.

GLEN I. TAKAHASHI, CITY CLERK

ERNEST Y. MARTIN, CHAIR AND PRESIDING OFFICER